PART IV FACILITY DESIGN AND OPERATIONS

Part IV provides general information regarding the overall design features and operational procedures for the Hazardous Waste Management Facilities. **Parts IV.1**, **IV.2**, and **IV.3** address permitting requirements for container storage areas, tank systems, and miscellaneous unit treatment areas, respectively. **Part IV.4** presents the design criteria for the secondary containment systems, the liquid waste storage limitations, and the management of liquids that may accumulate within the containment zones. **Part IV.5** identifies the air emission controls that are used to comply with the requirements of Resource Conservation and Recovery Act (RCRA) Air Emission Standards, Subparts AA, BB, and CC. **Part IV.6** addresses other nonpermitted activities that occur at the Hazardous Waste Management Facilities. **Part IV.7** addresses the ground water and environmental monitoring requirements for the Hazardous Waste Management (HWM) units that are located at the LLNL main site. Additional unit-specific design and operational information regarding containers, tanks, and miscellaneous units are discussed within the unit-specific volumes in **Part XIV** of this permit application.

1 Container Storage Areas

The types of waste that are stored in each container storage unit is summarized in **Table IV-1**. HWM units that are designated only as S01 container storage units are primarily dedicated to the long-term storage of containers (e.g., typically for greater than 90 days). Bulking and blending may also occur within these S01 areas, but not for the purpose of changing the hazardous characteristics of the waste. Adsorbents may be used to manage the contents of leaking/deteriorated containers, or in response to leaks/spills. Containers are also stored in the designated X02 and X99 miscellaneous unit treatment areas to accommodate the process operations (e.g., waste feeding and effluent holding). These containers are normally stored temporarily in the process areas for periods less than 30 days; however, some containers may be stored longer. **Parts IV.1.1** to **IV.1.5** address the specific regulatory requirements of Title 22 of the California Code of Regulations (CCR) 66264, Article 9 (Use and Management of Containers).

1.1 Container Descriptions

As defined in 22 CCR 66260.10, containers are any portable devices that are used to store, handle, treat, transport, recycle, or dispose of a hazardous waste. The definition specifically includes portable tanks having a capacity greater than 110 gal. In general, the containers used at LLNL range in size from 1 mL to 5000 gal and include cans, bags, vials, jars, bottles, drums, boxes, carboys, portable tanks, and tank trailers.

More detailed information regarding the types of containers, portable tanks, liners, and overpacking materials used at LLNL is provided in Table 8 of the *Waste Analysis Plan* (WAP) in **Appendix III-A**. This table also identifies the type of wastes suitable for storage in each container. Specifications of the portable tanks and tankers used are presented in **Table IV-2**. (Tankers are sometimes referred to as cargo tanks, vacuum tankers, tank trailers, or tank trucks.)

Metal portable tanks range from 400 to 1100 gal and are used to store liquid wastes. The metal portable tanks are horizontal, cylindrical, single-walled, and 304 or 316 stainless steel or mild steel tanks.

Plastic portable tanks are used to store large quantities of liquid wastes. These plastic portable tanks meet U.S. Department of Transportation (DOT) specifications or have DOT exemptions. The portable tanks are constructed of polyethylene and have the capacity of 330 to 10,000 gal.

Metal tank trailers are 500 to 5000 gal and are used to store liquid wastes. Metal tank trailers may be vacuum or nonvacuum tankers that meet DOT specifications. They may be constructed of carbon steel or stainless steel. A vacuum/pressure pump is mounted on the front of the tank trailer. The pumps are rated for approximately 40-psig pressure and 27-mm Hg vacuum.

Portable tanks and tankers may occasionally be rented from a vendor whenever a shortage occurs at Hazardous Waste Management Facilities. Rented portable tanks and tankers have the same specifications as those used on site and may only be used to hold nonradioactive wastes.

1.2 Container Compatibility Information

All containers, portable tanks, liners, and overpacking material used at the LLNL main site are carefully selected for their compatibility with the wastes. Selection criteria include previous operational experience, the construction materials used in the original shipping container, waste characterization information and physical properties, the DOT hazard class of the chemical constituents, and material compatibility references. Liquid wastes are typically stored in metal, plastic, or glass containers. Solid waste and waste that does not contain free liquids can be stored in cellulose containers in addition to metal, plastic, or glass containers. Metal cylinders are used to store gaseous waste or liquefied gas waste.

1.3 Management Practices for Containers

This Part describes how containers are managed to prevent spillage and leaks.

1.3.1 Container Handling

Containers are kept closed except when wastes are being added or removed (as in sampling, bulking, repackaging, or lab-packing operations). Bungs are tightened and rings are bolted; can lids are shut; valves on tank trailers and portable tanks are kept shut; and boxes are crimped, clamped, stapled, or nailed shut. Portable tank lids are screwed tight or clamped down. Also, quick disconnects on tank trailers and portable tanks are capped when not in use. The tanker lid/access ways are clamped shut. However, some waste containers may need to be vented to prevent pressure build-up and/or explosion hazards. For example, gas-permeable caps may be used on containers of organic waste to comply with fire safety standards. Containers of hydrogen peroxide may be vented using plugs that prevent the escape of liquids. When required either to comply with air emission requirements (e.g., 40 Code of Federal Regulations [CFR] 264 Subpart CC) or to prevent other types of releases (e.g., radionuclides), the container vents are fitted with carbon and/or high-efficiency particulate air (HEPA) filters.

Gas cylinders are stored in a secured upright position, strapped to a pallet in a horizontal position, or overpacked in an approved container. Gas cylinders are stored in a manner that prevents rupture should the cylinder be dropped, tipped, or hit by a heavy falling object. The cylinder valves are closed and valve caps, when present, are kept in place. Gas cylinders with internal pressure approaching atmospheric pressure are labeled "Empty." Cylinders that are not labeled "Empty" are considered to be full.

Containers are handled and transported in a manner that prevents rupture or leaking. The handling of containers is performed in accordance with the Lawrence Livermore National Laboratory (LLNL) *Onsite Hazardous Materials Packaging and Transportation Safety Manual* (LLNL, latest revision). This guidance manual addresses the transportation of hazardous materials, substances, and wastes within the LLNL main site boundaries. The topics covered by this manual that are relevant to waste handling include:

- Responsibilities of HWM Division personnel
- Securing containers during transportation
- Requirements for vehicles transporting hazardous waste.

Containers are frequently transported manually (e.g., carried, drum dolly) or by forklift. Drums and smaller containers moved by forklifts are placed on pallets and secured by wire banding, tape, use of pallets with container stabilization edges in permitted areas of the Hazardous Waste Management facility, or other means to prevent them from falling from the pallets during transport. Some containers, such as portable tanks and boxes, have skids that are designed to be transported by a forklift. The forklift operator follows all forklift operating procedures and the speed limit to minimize the potential for spillage and accidents. When using forklift attachments (e.g., grippers, hooks, etc.) to move drums, the forklift operator ensures that the attachment device is properly sized for the drum and the drum is secure before moving the container. Pickup and flatbed trucks are also used to transport containers. Containers and pallets are secured to the bed of the truck prior to transport. Additional details of the equipment used to handle waste containers are provided in **Part VI.2.4.**

Liquid waste is normally transported in containers, portable tanks, and tank trucks. Most liquid waste is treated either at the Liquid Waste Processing (LWP) area waste blending station or the Decontamination and Waste Treatment Facility (DWTF) tank farm. However, some of the waste containers may be placed into a container storage area. Liquid waste transfer operations involving containers and portable tanks are conducted within secondary containment (see **Part VI.2.4.2** for a description of liquid waste transfer). Transfer of waste from containers to tank trucks (i.e., stinging) occurs with the containers either (1) located in a permitted container storage unit or (2) placed inside a portable berm. Because the tanker is likely to be outside of secondary containment, a tray or bucket is placed under the hose connections during connecting and decoupling.

A portable berm is a type of secondary containment normally used outdoors, which can be set up to provide containment of containers for the stinging operation. The base and rigid or inflatable side walls of the portable berm are continuously lined; any seams in the liner are sealed so that it

remains leakproof. The liner is made of a durable material which is resistant to the type of chemical to be contained and to degradation from the weather. The portable berm must have sufficient capacity to contain 10% of the aggregate volume of all containers or the volume of the largest container, whichever is greater.

1.3.2 Container Inspection and Maintenance

The storage and processing areas are inspected at least every week by HWM Division personnel to ensure that waste containers are in good condition. The inspection and corrective action procedures are described in **Part VI.4**. Containers that are found to be damaged, deteriorated, or leaking are managed as identified in **Part VI.2.6.4.**

1.3.3 Management of Empty Containers

When waste is transferred from a barcoded container or portable tank, its movement is tracked electronically by scanning the barcode and entering the code for the unpacking action into HWM Division's Total Waste Management System (TWMS) database.

When emptied, containers other than portable tanks and tankers are designated for reuse or disposal. If these containers are to be reused, their markings and labels (including the barcode tag) are invalid and removed. (Reuse of empty containers is described below.) If the container is to be disposed of, the barcode is not removed, and its disposition continues to be tracked using TWMS until the container is shipped off site. Non-reusable containers that contained hazardous or mixed wastes may be compacted in the Building 612 Drum Crusher, placed into storage, or directly shipped off site for disposal. The compacted containers facilitate packaging and reduce the volume of waste to be disposed.

Portable tanks and cargo tanks are permanently marked with a barcode for identification. When waste is unloaded, the barcode is scanned but is not removed. The status of the portable tank or cargo tank is tracked using TWMS.

Containers that previously held hazardous wastes are managed in accordance with 22 CCR 66261.7 (Contaminated Containers). The emptied containers may be rinsed as required to conform with these management requirements. Drum rinsing is done in the Drum Rinsing Station located in Building 695.

Empty, open-head metal and plastic drums, which were previously used for storage and transport of hazardous materials, may be reused for storage and transport of hazardous waste if they meet the inspection requirements listed below. A container previously used in commerce can only be re-used for off-site shipments when it contains the same type of waste as previously. The container must have been emptied in accordance with 22 CCR 66261.7, subsections (b) and (d). In addition, the container must be free of radioactive materials. When a container is reused, a new barcode is applied.

The container is checked for the following:

- Free of holes or perforations

- Free of flaking rust
- Undamaged seams and continuous welds
- Gasket is intact and is not deformed (or, the gasket is replaced)
- Free of dents that might compromise its integrity
- Inner protective coating is not chipped, scratched, or peeling
- Closure points are in good condition
- Free of any other defects that might compromise its integrity.

1.3.4 Off-site Transport Portable Tanks and Tankers

Portable tanks and tankers may be released for transportation off site if it has been determined that the portable tank or tanker is in acceptable condition. The following criteria must be verified through inspection before release of a loaded portable tank or tanker is approved by HWM Division:

- Tank condition is acceptable for transport
- Valves, hatches, access ports, caps, cam-lock caps, etc., are closed and/or fastened in place
- Appropriate labeling is in place.

A HWM Shipment Operations Portable Tank / Tanker Checklist (see **Appendix VI-A**) is used as a record of inspection prior to the release of a portable tank or tanker.

A portable tank or tanker which held hazardous waste may only be transported as empty if it meets the empty container requirements in 22 CCR 66261.7. The form, Empty Portable Tank / Cargo Tank Verification (see **Appendix VI-A**), must be completed to document the following:

- Status of tank rinsing
- Tank content has been inspected and found to meet the regulatory criteria for an empty container or cargo tank
- Valves, hatches, access ports, caps, cam-lock caps, etc., are closed and/or fastened in place
- Portable or cargo tank is in good condition, including any gaskets
- Previous markings and labels have been removed.

Regardless of whether it is empty or full, the portable tank or tanker must also meet the shipping requirements of 49 CFR.

1.3.5 Special Requirements for Ignitable, Reactive, or Incompatible Containerized Waste

The provisions for complying with handling ignitable, reactive, or incompatible containerized waste are addressed in **Parts VI.2.4.6** and **VI.2.4.7.**

1.4 Secondary Containment for Containers

All containerized liquid hazardous waste (including waste containing free liquids) is stored within a secondary containment zone. Compliance with the regulatory requirements (22 CCR 66264.175) for secondary containment is addressed in **Part IV.4**. The capacity calculations and other engineering details for each containment zone are presented in the secondary containment reports that are included as appendices to the unit-specific volumes in **Part XIV** of this permit application.

1.5 Treatment in Containers

The following treatment activities are conducted in containers:

- Waste is treated in containers via the solidification system, a miscellaneous treatment unit, that is located in the Building 695 LWP area. Waste and solidification agents are mixed in processing containers, and the mixture is allowed to set and cure. The solidification process is described in **Appendix XIV.4-J** of this permit application.

- Several treatment processes are performed in portable tanks at the waste blending station, including, but not necessarily limited to, blending, chemical reagent additions and mixing, and air stripping.

- Small Scale Treatment (SST) laboratory uses containers, as described in **Part XIV.4.7.1.**

The potential hazards that could occur as a result of processing waste in containers discussed above are primarily limited to mixing incompatible materials together during blending or bulking operations. Administrative controls are used to ensure that potential incompatible wastes are not bulked or blended in a manner which could result in an uncontrolled reaction. Waste streams are not treated unless prior approval has been granted by a qualified HWM Division process engineer, chemist, or facility supervisor. See **Part VI.2** for a description of documents which may be prepared for activities that require containerized wastes to be processed.

1.6 Closure of Container Storage Unit

The requirements for closing container storage units are presented in the Closure Plans that are included as appendices to the unit-specific volumes in **Part XIV** of this permit application.

2 Storage/Treatment Tanks

As defined in 22 CCR 66260.10, tanks are stationary devices that are designed to contain an accumulation of hazardous waste and are constructed primarily of nonearthen materials (e.g., wood, concrete, steel, plastic). Some of the treatment equipment that are installed in Building 695 have vessels to carry out the treatment processes. These process vessels are not tanks because they are not designed to "contain an accumulation of hazardous waste" but are for the processing of waste. The treatment equipment is considered to be part of the miscellaneous unit treatment area and are, therefore, addressed in **Part IV.3**.

The DWTF tank farm is comprised of nine tank systems installed within Building 695 for the storage and treatment of aqueous waste waters. These tank systems are designed to be interchangeable. As such, common materials of construction and ancillary equipment are used. Because these are the only tank systems within the Hazardous Waste Management Facilities, compliance with requirements of 22 CCR 66264, Article 10 (Tank Systems) is addressed in Building 695 Storage/Treatment Unit Group (S/TUG) unit volume (**Part XIV.4**).

3 Miscellaneous Units

As defined in 22 CCR 66260.10, a miscellaneous unit is a contiguous area of land on or in which hazardous waste is placed (e.g., disposed of), or the largest area in which there is significant likelihood of mixing (e.g., transferring, treating, or storing) hazardous waste in the same area. Containers, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators, boilers, industrial furnaces, underground injection wells, containment buildings, corrective action management units, and research, development, and demonstration units do not qualify as miscellaneous units. Other types of equipment and devices used for the storage, treatment, and/or disposal of hazardous waste are typically permitted under the miscellaneous unit performance provisions.

To treat and process hazardous and mixed wastes, LLNL main site uses equipment that does not have specific regulatory requirements governing their design and operation. Consistent with the definition of a miscellaneous unit, this equipment was grouped together to form five separate miscellaneous unit treatment areas based on contiguousness of containment zones, ventilation controls, and other environmental protection systems. Three miscellaneous unit treatment areas are located in Building 695 and include the LWP area, the Reactive Waste Processing (RWP) area, and the SST laboratory. These Building 695 areas are designed to allow movement of the treatment equipment and provide operational flexibility in determining the appropriate treatment train to treat a particular waste stream or batch. Collectively, these areas are called the Building 695 S/TUG.

The miscellaneous treatment units in the Building 695 S/TUG are listed below:

- The LWP area includes a waste blending station, shredder, chopper, centrifuge, filtration module, waste blending station, debris washer, drum rinsing station, solidification unit, gas adsorption system, and cold vapor evaporator.

- The RWP area includes the uranium bleaching unit (operated in the walk-in hood inside the reactive materials cell), the water reactor (operated in the inert atmosphere or combination hazards glove boxes located in the RWP room), the pressure reactor, and the mercury amalgamator. The pressure reactor and the mercury amalgamator can be operated anywhere within the RWP area.

- The SST laboratory provides another location where the pressure reactor and the mercury amalgamator can be operated.

The other two miscellaneous units, the Drum Crusher and the Size Reduction Unit, are individual pieces of equipment that are located in Building 612. These pieces of equipment are considered separate units because they are not readily mobile, have a specific dedicated use, and have associated environmental controls that are unique to the treatment equipment. Moreover, Building 612 is not designed to accommodate the relocation of this equipment without modification of foundations and other features.

General information regarding the design and operation of these miscellaneous unit treatment areas is provided in **Part IV.3.1**. Detailed information for the construction and operation of the individual pieces of treatment equipment is provided in the respective unit-specific volumes in **Part XIV** of this permit application. This detailed information also contains a description of the S/TUG and treatment equipment-specific controls that will be installed to protect workers and prevent releases to the environment.

3.1 General Miscellaneous Unit Information

Various pieces of equipment are used at the LLNL main site to provide the required treatment capability and capacity to treat the wide range of wastes that are generated by the LLNL operations. Solid hazardous and mixed wastes are primarily processed in Area 612. A Drum Crusher and Size Reduction units are installed in Building 612 to facilitate these solid waste operations. Aqueous waste waters, other liquid waste, and debris contaminated with hazardous waste are primarily treated in the LWP area miscellaneous treatment units in conjunction with the tank farm. As previously described, specialized treatment and control equipment are provided in the RWP area and the SST laboratory to process reactive waste and other infrequently generated waste. The primary miscellaneous treatment processes include:

- Concentration and volume reduction of waste waters through evaporation

- Physical removal of hazardous components via separation processes (e.g., filtration, centrifugation, adsorption, and stripping)

- Neutralization, oxidation, reduction, and precipitation reactions by adding various chemical reagents to the waste in mixing vessels or reactors

- Solid waste and debris treatment using size reduction and chemical extraction

- Immobilization of contaminants with solidification processes

- Container emptying, rinsing, and crushing
- Decontamination and size reduction of contaminated equipment and other structures
- Scrubbing and adsorption of gases from emptying compressed cylinders
- Sorting and packing of laboratory chemicals for off-site shipment
- Blending and bulking of wastes to facilitate subsequent treatment processes and/or provide consolidation of waste for off-site shipment
- Small scale treatment of infrequently generated waste.

Unit-specific information contained in **Part XIV** identify and describe the scope of the above treatment processes. As stipulated in 22 CCR 66264.601, the design and operating criteria for miscellaneous units are performance-based. In accordance with this criteria, releases of hazardous waste to subsurface soils, ground water, surface soils/water, and air that could threaten human health or the environment must be prevented. To ensure that adequate controls are provided, potential incidents that could contribute to an off-site release of hazardous waste from a miscellaneous unit were identified and evaluated through safety and risk analyses (see **Part VI.2**). It was concluded that the most likely incidents of a spill or release of hazardous constituents are due to process upsets or equipment failure. At the LLNL main site, these release incidents are prevented by:

- Maintaining area-wide secondary containment systems. Each miscellaneous unit is secondarily contained as described in **Part IV.4** of this permit application. This will prevent the release of spills to the environment. Although a majority of the treatment equipment will be attached to mobile skids, no treatment or process operation, other than infrequent treatment in containers, will occur outside of a miscellaneous unit treatment area.
- Conducting operations in enclosed structures for weather protection to prevent contamination of rainwater and wind dispersal of contaminants.
- Providing ventilation and off-gas treatment systems where significant process emissions are expected.
- Using engineering devices (e.g., process controls) and administrative controls (e.g., operational procedures) to ensure that treatment equipment is operated safely and effectively. (See **Part VI.2** for a discussion of administrative controls.)

4 Secondary Containment Zones

Secondary containment is provided for all HWM Division units except for the Area 612-1 and 612-5 Container Storage Units and the roll-off bin area, which are not required to have secondary containment because these areas are restricted to storing only solid waste. Although secondary containment is provided for Building 280 and the Building 693 Classified Waste Storage Annex, it is designed to retain only contaminated water due to a fire. Some of the secondary containment

systems are divided into separate containment zones based on geographical location and to prevent the mixture of incompatible materials in the event of a spill. Each containment zone is designed to provide adequate capacity for expected operations, to prevent releases into the environment, and to isolate spills from adjacent containment zones. The physical boundaries and engineering details of the containment zones are presented in the unit-specific volumes in **Part XIV** of this permit application.

Part IV.4.1 describes the general criteria used to design the secondary containment systems. **Part IV.4.2** discusses the methodology for determining the secondary containment capacities and liquid waste storage limitations. **Part IV.4.3** identifies the management of liquids that may accumulate within the containment zones.

4.1 Secondary Containment System Design Criteria

All of the secondary containment zones were designed in accordance with the requirements of 22 CCR 66264.25 and 66264.175 for container storage. The requirements of 22 CCR 66264.193 were also incorporated into the design of the LWP area containment zone since this zone provides containment for both containers and tank systems.

In general, each secondary containment zone consist of a concrete floor that is sloped towards a grated trench and/or sump. (Note: The only exception to this secondary containment design is the Building 693 Yard freezer storage unit. Secondary containment for the freezer is provided by the internal metal pan. A description of this secondary containment system is provided in **Part XIV.3** of this permit application.) If a trench is used, it is typically sloped towards a sump to facilitate the detection and removal of accumulated liquids. Daily visual inspections are used to determine if liquids have accumulated in any of the sumps. The liquids are removed manually using portable equipment such as pumps, containers, mops, and buckets.

The concrete floors are sloped to prevent ponding of liquids on the concrete surfaces while providing a sufficiently level surface for proper equipment operations. Most of the concrete floors and other surfaces (e.g., curbs and dikes) that may come in contact with spill waste are coated with a high-solids epoxy, latex, or acrylic enamel. Manufacturers' data for the specific types of sealants used are presented in **Appendix IV-A** of this permit application. The data suggest that the coatings seal any cracks or gaps. As such, water stops are not required to be installed in the concrete floor along the construction joints. The selected sealants are also chemically resistant and impermeable to the wastes expected to be stored and processed at the LLNL main site. Highly abrasion-resistant coatings are or used in areas where heavy equipment, such as forklifts, will be used. The coatings showing visual evidence of deterioration will be repaired or recoated as required to maintain the integrity of the secondary containment zone. Functionally equivalent sealants may be used for recoating applications.

4.2 Containment Capacities and Liquid Storage Limitations

As required by 22 CCR 66264.175(b)(3) and 66264.193(e)(1)(A), each secondary containment system zone must be sized to contain the precipitation from a 24-hour, 25-year storm plus 10 percent of the aggregate liquid storage volume or the capacity of the largest container, whichever is greater. To ensure that this standard is maintained, liquid storage limits have been

established for each containment zone. Administrative inventory controls and inspections are utilized to verify that the storage limits are not exceeded. The engineering calculations for determining the secondary containment capacities and precipitation volume are provided in the secondary containment reports that are included as appendices to the **Part XIV** unit volumes. Tables that summarize the containment capacities and liquid storage limits for each containment zone are provided in the respective **Part XIV** unit volumes. The terms and methodology used to calculate the secondary containment capacities and associated liquid storage limits are as follows.

- The **gross secondary containment volume** is the total void space defined by the physical dimensions of the containment zone and associated structures (e.g., berms, trenches, sumps).

- The **obstruction displacement volume** is the displacement from objects, such as container pallets and equipment skids, that are located within the containment zone and must be subtracted from the gross secondary containment volume to determine the actual volume available to contain leaks, spills, and/or precipitation.

- The **rainfall/run-on contingency volume** is the volume of precipitation and associated run-on from a 25-year, 24-hour storm that could enter into the containment zone. For most containment zones, precipitation and run-on are eliminated or significantly minimized by a combination of curbs, diversion drains/ditches, building enclosures, and canopy roofs. For canopy roofs, the amount of rainfall that could be blown into containment zone is included in the calculated contingency volume. In accordance with 22 CCR 66264.25, the precipitation and run-on controls are designed to function without failure when subjected to capacity, hydrostatic, and hydrodynamic loads resulting from the maximum intensity of a 25-year storm.

- The **net secondary containment capacity** is gross secondary containment volume minus the obstruction displacement and rainfall/run-on contingency volumes. The net capacity represents the volume that is available to contain leaks and spills. Where appropriate, a safety factor was applied to determine the **net operating capacity of the secondary containment zone**. The safety factor provides an added level of conservatism should the gross containment volume be overestimated and/or displacement obstructions be underestimated.

- To comply with regulatory requirements for secondary containment, liquid waste storage limitations were established for each containment zone. The **largest capacity limit** is the maximum volume for any single item (e.g., container, portable tank, storage/treatment tank, or treatment equipment) that can be stored within the containment zone. The largest inventory limit cannot exceed the net operating capacity of the secondary containment zone. The **total inventory limit** represents the combined liquid volume limit for all containers, tanks, and process vessels located within the containment zone. The net operating capacity of the secondary containment zone must be at least 10 percent of the total inventory limit or must at least equal the volume of the largest container (largest capacity limit), whichever is greater.

Where automatic fire suppression systems are provided, retention capacity for the volume of water that would result from the operation of the suppression system in the event of a fire was determined to ensure that containment volume is adequate. The fire water contingency volumes are based on the design sprinkler/mist head flow rate of the suppression system over a 20-minute period. For small rooms, such as the reactive materials cell, it is assumed that all of the sprinkler heads in the room are operational for the full 20 minutes. In large room areas, such as the LWP area, a realistic scenario was used to determine the expected number of sprinkler heads that would be activated in order to extinguish a credible the fire over the 20-minute duration. When the gross secondary containment capacity (less the obstruction displacement volume) is not adequate to retain the calculated fire water contingency volume, underground retention tanks or some other mechanism are used to provide the additional retention capacity. Underground retention tanks are used in Area 612-4 and DWTF truck bay. (Note: The contingency volume for a 25-year, 24-hour storm [i.e., precipitation and run-on] is not used in determining the need for fire water retention because the simultaneous occurrence of these two events is unlikely.) **Part VI.6.6** and the unit-specific volumes of **Part XIV** of this permit application provide additional information regarding the fire water retention systems.

4.3 Accumulated Liquids

Per 22 CCR 66264.175(b)(5), spilled or leaked waste and accumulated precipitation must be removed from the secondary containment system as required to prevent overflow. The accumulated liquid monitoring and discharge practices identified below are based on agreements between LLNL and the City of Livermore Water Reclamation Plant (LWRP). In general, the accumulated liquids are managed based on volume accumulated, history of spills/leaks, and analytical results when samples are required to be collected. The accumulation points (i.e., sumps and trenches) are typically visually inspected to determine if liquids are present. ~~Some containment zones (e.g., all trenches and sumps located in Building 695 and Area 612-4 underground fire water retention tanks) are equipped with electronic detection devices which activate an alarm when accumulated liquids are present.~~ If liquids are observed or detected, the source (e.g., precipitation, decontamination, tap water used for a specific purpose, or possibly a spill or leak) of the liquids is determined. As described in Section 5.5.2 of the WAP in **Appendix III-A**, samples may be collected and analyzed if the source cannot be determined or characterization of the spill is in question. If the source of the accumulated liquids can be traced to a particular container or tank, sampling and analysis are not necessary because the contents are on record. After the source has been determined, the accumulated liquids are removed by pumping, absorbing, mopping, or other appropriate methods. The liquids and associated absorbent materials are then managed in accordance with the liquid and solid waste decision trees (**Figures 11-1** and **11-2**) in the WAP.

For storage areas that are not completely enclosed, the source of accumulated liquids is expected to be the result of precipitation. Section 5.5.2 of the WAP provides a discussion of the requirements for sampling and analysis of rainwater. (Note: Puddles of rainwater that do not exceed a depth of 1/2 in. do not interfere with operations and do not compromise secondary containment capacity are not removed and are allowed to evaporate.) If analytical results are within the LWRP discharge limitations, the accumulated liquids are discharged to the sanitary sewer. If the analytical data indicate that the accumulated liquid does not meet sanitary sewer discharge criteria or a spill/leak

has occurred, the liquids are removed using a wet-dry vacuum, portable pump, or similar collection device and transferred into appropriate containers. See **Part VI.2.4.2** for further discussion of liquid waste transfers. The contaminated liquids are then managed in accordance with the liquid waste decision tree (**Figure 11-1**) shown in the WAP in **Appendix III-A**. In addition, the containment area is decontaminated to the extent required to ensure that accumulated liquids from subsequent precipitation events can be discharged to the sanitary sewer. The analytical results for the accumulated liquid are typically used to determine if towels, absorbents, or other materials used to decontaminate the area must be handled as hazardous waste.

In one area of the Area 612 yard, gravity drain lines are used to drain the accumulated rainwater directly into the sanitary sewer. A normally closed and locked isolation valve is located on the drain line to prevent unauthorized discharges. The keys to these locks are under the administrative control of the HWM Division supervisors.

Liquids that accumulate within the containment zones of the enclosed processing and storage areas are typically from decontamination activities and leaks/spills, respectively. These liquids are transferred into containers or portable tanks. Samples are collected and analyzed to determine the appropriate management requirements, as described in the WAP. Towels or other absorbent materials may be used to remove small volumes of accumulated liquids from a secondary containment zone. The resulting solid waste is collected, placed into a container, and appropriately managed. The analytical results for the accumulated liquid is typically used to determine if towels, absorbents, or other materials used to decontaminate the area must be handled as hazardous waste.

As required by 22 CCR 66264.193(c)(3), accumulated liquids from tank systems (e.g., the LWP area) must be detected within 24 hours. Visual inspections of the LWP area are conducted each operating day. If inspectors observe leaks or liquids on the floor, the appropriate corrective actions are initiated. As such, these daily visual inspections allow leaks to be detected within approximately 24 hours and, therefore, comply with regulatory requirements. In addition, 22 CCR 66264.193(c)(4) requires that leaks/spills be removed within 24 hours to prevent overfill of the secondary containment zone. Although spills/leaks can be removed from the secondary containment system within 24 hours, provisions to remove liquids are made only after the situation has been fully assessed for safety considerations (e.g., radiation hazards). The spill removal procedures, including additional time required to assess the safety of the situation, comply with these regulatory requirements because the LWP area tank farm is totally enclosed to prevent precipitation and run-on. In addition, the potential for overflows is negligible since the associated secondary containment zone has a large excess containment capacity.

4.3.1 Discharge to the Sanitary Sewer

Prior to any discharge to the sanitary sewer, waste water must be tested and found to meet or fall below internal discharge limits. In addition, authorization must be obtained from the Operations and Regulatory Affairs Division (ORAD) in the Environmental Protection Department (EPD) before discharge of the sewerable waste water is initiated.

HWM Division submits the analytical data on the waste water to ORAD with a written or verbal request to discharge. These analytical results are reviewed by ORAD for conformance to

internal discharge requirements. ORAD then issues approval or disapproval of the discharge. (Further treatment of the waste water is conducted as necessary to meet discharge requirements.) Once the waste water meets these requirements, ORAD issues an approval for discharge via a Wastewater Discharge Authorization Record (WDAR). HWM then discharges the waste water through the discharge port at the Area 612 Facility or the DWTF, which are kept locked and to which only selected personnel have custody of the key. A record of the discharges (including analytical number, WDAR number, effluent source, release date and time, time of day that the valve was locked again, sewer discharge valve number, approximate volume of discharge, the name and signature of the person performing the discharge, and any observations) is recorded in the sewer release record book. A copy of the completed WDAR sent from ORAD is also retained in HWM's facility records.

Approval to discharge rainwater and other liquids accumulated in secondary containment systems of permitted units to the sanitary sewer must be obtained from ORAD using a WDAR.

5 Air Emission Controls

5.1 RCRA Subpart AA

The process vent standards in 40 CFR Parts 264, Subpart AA and 22 CCR 66264, Article 27, limit organic air emissions associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage RCRA hazardous wastes with organic concentrations of at least 10 ppmw. The units in the DWTF which are potentially regulated by the AA Rule include the Cold Vapor Evaporator, the Debris Washer, and the Waste Blending Station. The type of control device used to comply with the AA Rule are carbon adsorption systems and the VOC scrubber which are designed and operated with a control efficiency of 95 wt% or greater. One carbon adsorption system is used for the Cold Vapor Evaporator and Waste Blending Station, and a separate one is used for the Debris Washer. The carbon adsorption systems and the VOC scrubber are described in **Part XIV.4.3.3.**

Documentation for compliance with standards for process vents and closed-vent systems and control devices is kept in the facility operating record for a period of three years. The performance and test data or design information to show 95 percent control efficiency must be maintained in the facility operating record for the life of the equipment or until replaced.

Refer to **Part VI.5** for AA Rule recordkeeping requirements. Refer to **Part VI.5.8** for AA Rule reporting requirements.

5.2 RCRA Subpart BB

The equipment leak standards in 40 CFR Parts 264, Subpart BB, and 22 CCR 66264, Article 28, minimize organic air emissions from equipment leaks at hazardous waste treatment, storage, and disposal facilities (TSDFs). The Subpart BB standards generally affect equipment containing or contacting RCRA hazardous wastes with 10 wt% or more gaseous or liquid organics. A leak is defined as 10,000 ppm based on a reference compound.

Because wastes managed in HWM Division units vary widely in composition, a case-by-case determination must be made as to when the requirements of this Rule are applicable. BB Rule requirements are implemented, as specified in the regulation, either (1) if it is determined that a piece of equipment, even on an occasional basis, contains or contacts RCRA liquid or gaseous hazardous waste containing 10 wt% or greater organics, or (2) if equipment that contains or contacts hazardous waste with an organic concentration of at least 10 wt% for less than 300 hours per calendar year, the exclusion in 22 CCR 66264.1050 (f) for following requirements in 66264.1052 through 66264.1060 may be implemented by identifying this equipment either by list or location (area or group).

Transferring RCRA liquid or gaseous wastes containing 10 wt% or more organics requires that the equipment be compliant with BB Rule requirements. This equipment includes pumps, valves, compressors, sampling connection systems, open-ended valves or lines, pressure relief devices, flanges and other connectors.

Should the BB Rule exclusion not be implemented or applicable, work practices are based on a leak detection and repair (LDAR) program. The LDAR program varies by source type, but includes:

- Leak detection monitoring, using Method 21 of the U.S. Environmental Protection Agency (EPA)
- Inspections (visual and olfactory)
- Repair with a given time frame (first attempt within 24 hours; repair completed within 15 calendar days).

Documentation demonstrating compliance is kept for a minimum period of three years. Refer to **Part VI.5.8** for BB Rule reporting requirements.

5.3 RCRA Subpart CC

The HWM Division manages waste containing volatile organic (VO) compounds in accordance with the CC Rule: Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers, Title 40, CFR 264.1080 through 264.1091.

5.3.1 Waste Determination

Waste characterization (including determining the average volatile organic concentration at the point of waste origination) is conducted in accordance with the WAP and satisfies the waste determination requirements in 40 CFR 264.1083. Waste determination is reviewed and updated as necessary at least once every 12 months following the initial determination.

5.3.2 Container Standards

The CC Rule categorizes compliance requirements for containers into three levels of control based on design capacity and container use. Implementation of these requirements at LLNL is

summarized in **Table IV-3**. DOT-compliant containers are used as the means to meet level 1 container control requirements. Using either a DOT-compliant container, a container that operates with no detectable emissions, or a container that has been demonstrated to be vapor tight are three different ways that level 2 container controls may be met.

Transfer of hazardous waste in or out of a container with level 2 control is conducted in such a manner as to minimize exposure of the hazardous waste to the atmosphere, to the extent practical, considering the physical properties of the hazardous waste and good engineering and safety practices for handling flammable, ignitable, explosive, reactive, or other hazardous materials.

To determine whether a container with design capacity greater than 0.46 m^3 is in light material service, RHWM personnel (usually the Field Technicians or Chemists) and generators examine the total organic content of the waste to be placed in the container. If the concentration is equal to or greater than 20 wt%, container level 2 controls may be implemented in lieu of the less stringent regulatory requirement defined in footnote "b" of **Table IV-3**.

~~When treating waste regulated by the CC Rule, the Solidification Unit with its associated container are vented inside an enclosure which is exhausted through a closed-vent system to a carbon adsorption system (which is potentially preceded by a VOC scrubber) as the control device.~~ When treating waste regulated by the CC Rule, the Solidification Unit with its associated container are vented through a closed-vent system to a control device. The control device is a carbon adsorption system. This closed vent system and carbon adsorption system associated with the container level 3 controls per subpart CC are designed and operated as described below. The level 3 container enclosure for the Solidification Unit ~~is~~ is designed and operated in accordance with the criteria for a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR 52.741, Appendix B. The enclosure may have permanent or temporary openings to allow worker access, the passage of containers through the enclosure by conveyor or other mechanical means, the entry of permanent mechanical or electrical equipment, and direct airflow into the enclosure. The verification procedure for the enclosure as specified in Section 5.0 to "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" will be performed initially when the enclosure is first installed and annually thereafter. The closed-vent system and carbon adsorption system (which is potentially preceded by a VOC scrubber) associated with the container level 3 control ~~is~~ are designed and operated as described below (i.e., "Closed-vent System Standards" and "Control Device Standards").

5.3.3 Tank Standards

Air pollutant emissions from the DWTF tank farm are controlled using tank level 2 controls, whereby the tanks are vented through a closed-vent system to a control device (carbon adsorption system which is potentially preceded by a VOC scrubber), in accordance with the requirements specified below. Each tank is covered by a fixed roof and vented directly through a closed-vent system to a control device as follows:

- The fixed roof and its closure devices are designed to form a continuous barrier over the entire surface area of the liquid in the tank.

- As required for operations where the pressure in the vapor headspace underneath the fixed roof is less than atmospheric pressure when the control device is operating, each opening in the fixed roof not vented to the control device is equipped with a closure device. The closure devices are designed to operate such that when the closure device is secured in the closed position, there are no visible cracks, holes, gaps, or other open spaces in the closure device or between the perimeter of the cover opening and the closure device.

- The fixed roof and its closure devices are made of suitable materials that minimize exposure of the hazardous waste to the atmosphere, to the extent practical, and that maintain the integrity of the fixed roof and closure devices throughout their intended service life.

The closed-vent system and control device are designed and operated in accordance with the requirements of 40 CFR 264.1087, as described in the next sections, "Closed-vent System Standards" and "Control Device Standards."

Transfer of hazardous waste to a tank subject to the CC Rule from another tank is conducted using continuous hard piping or another closed system that does not allow exposure of the hazardous waste to the atmosphere.

5.3.4 Closed-vent System Standards

The closed-vent system routes gases, vapors, and fumes emitted from the hazardous waste in a container or tank to a carbon adsorption system (and potentially a VOC scrubber), which is the control device selected to meet CC Rule requirements. These systems are designed and operated to reduce the total organic content of the inlet vapor stream to the control device by at least 95 wt%.

The closed-vent system is designed to operate at a pressure below atmospheric pressure, and it is equipped with at least one pressure gauge or other pressure measurement device that can be read from a readily accessible location to verify that negative pressure is being maintained in the closed-vent system when the control device is operating.

Any bypass devices installed on the closed-vent system (that could be used to divert the gas or vapor stream to the atmosphere before entering the control device), is equipped with either (1) a flow indicator installed at the inlet to the bypass line or (2) a seal or locking device. If a locking device is used, the device is placed on the mechanism by which the bypass device position is controlled (e.g., valve handle, damper lever) when the bypass device is in the closed position such that the bypass device cannot be opened without breaking the seal or removing the lock. The seal or closure mechanism must be visually inspected at least once every month to verify that the bypass mechanism is maintained in the closed position.

5.3.5 Control Device Standards

Carbon adsorption systems comprised of carbon canisters or beds that are not regenerated directly on site in the control device are used as organic emission control devices for compliance with the CC Rule. Carbon adsorption systems are designed and operated to reduce the total organic content of the inlet vapor stream vented to the control device by at least 95 percent by

weight. In addition, a VOC scrubber, described in **Part XIV.4.3.3,** may be used to remove methanol from the off-gas before it reaches the carbon adsorption systems. The use of a VOC scrubber is required because of the low adsorption efficiency of methanol on carbon.

Achievement of the 95 wt% or greater control efficiency is demonstrated by one of the methods below. (For the carbon adsorptions systems, performance requirements are based on the total quantity of organics vented to the atmosphere from all carbon adsorption system equipment that is used for organic adsorption, organic desorption or carbon regeneration, organic recovery, and carbon disposal):

(1) A performance test conducted using the test methods and procedures specified in 40 CFR 264.1034(c)(1) through (c)(4);

(2) A design analysis conducted to meet the requirements specified in 40 CFR 264.1035(b)(4)(iii).

Following the initial startup of the carbon adsorption system, all activated carbon in the control device is replaced with fresh carbon on a regular basis in accordance with the following requirements:

(1) Monitor the concentration level of the organic compounds in the exhaust vent stream from the carbon adsorption system on a regular schedule and replace the existing carbon with fresh carbon immediately when carbon breakthrough is indicated. The monitoring frequency is daily or at an interval no greater than 20 percent of the time required to consume the total carbon working capacity established as a requirement of 40 CFR 264.1035(b)(4)(iii)(G), whichever is longer; or

(2) Replace the existing carbon with fresh carbon at a regular, predetermined time interval that is less than the design carbon replacement interval established as a requirement of 40 CFR 264.1035(b)(4)(iii)(G).

All carbon removed from the control device that is hazardous waste is managed in accordance with the requirements of 40 CFR 264.1033(n), regardless of the average volatile organic concentration of the carbon:

(1) Regenerated or reactivated in a thermal treatment unit, as described; or

(2) Incinerated in a hazardous waste incinerator, as described; or

(3) Burned in a boiler or industrial furnace, as described.

In accordance with the CC Rule, periods of planned routine maintenance of each carbon adsorption system or VOC scrubber do not exceed 240 hours per year. This is demonstrated by recording periods of planned maintenance anticipated and performed on a semi-annual basis, as specified in **Part VI.5**, Recordkeeping. Carbon adsorption system or VOC scrubber malfunctions (i.e., periods when the control device is not operating or not operating normally)

are corrected as soon as practicable after their occurrence in order to minimize excess emissions of air pollutants.

Also in accordance with the CC Rule, fumes are not actively vented to the carbon adsorption system or VOC scrubber during periods of planned maintenance or malfunction except in cases when it is necessary to vent the gases, vapors, and/or fumes to avoid an unsafe condition or to implement malfunction corrective actions or planned maintenance actions.

Refer to **Part VI.4** for inspection and monitoring requirements of the CC Rule. Refer to **Part VI.5** for recordkeeping requirements. Refer to **Part VI.5.8** for reporting requirements.

6 HWM Division Yard Operations

HWM Division conducts routine operations within the fenced boundary of each Hazardous Waste Management Facility. For the purpose of this permit application, the term "HWM Division Yard" is used to refer to the areas outside the confines of the permitted waste management units but within the fenced boundary of each Hazardous Waste Management Facility. General HWM Division Yard operations are necessary for the efficient management of the hazardous waste. Some examples of these operations include: temporary staging of collected rainwater awaiting approval for discharge to the sanitary sewer; storage of empty trucks, tankers, containers, and portable tanks; storage of nonhazardous waste; equipment or vehicle maintenance, if necessary; welding; approved discharges to the sanitary sewer; and automated or manual sweeping and cleaning. Typical activities performed in the HWM Division Yard that may involve regulated wastes include:

- Moving wastes to and from staging areas, treatment units, packaging or size reduction units, sampling areas, or storage units
- Loading and unloading of waste containers from transfer vehicles, forklifts, or other mechanized movers
- Transfer of liquid wastes
- Sampling containers, portable tanks, or cargo tankers
- Repackaging or overpacking
- Staging wastes for up to 36 hours for off-site shipment
- Staging wastes for up to 24 hours for various reasons such as during maintenance of a storage unit; during waste receipt and acceptance procedures; during a hold, if necessary, for a waste characterization to be verified; during the movement of other containers within a permitted unit; and prior to transfer to another Hazardous Waste Management Facility

- Loading and bulking solid wastes, such as asbestos, crushed containers or contaminated equipment, into containers, end-dumps, roll-offs, or other cargo trucks (secondary containment is provided)

- Accumulating solid waste generated by HWM Division under generator standards of 22 CCR 66262

- Handling of wastes during an emergency response, as necessary.

Activities in the HWM Division Yard are conducted safely under the supervision of trained technicians and/or supervisors. Secondary containment in the way of temporary berms, etc., are utilized for all liquid waste handling. Upon a worker's opening of a container, at least one trained worker must be aware of the ongoing operation and be within sight of the operation. Daily in-use inspections of the HWM Division Yards include visual inspection of waste containers in staging areas for leaks, deterioration, and duration of staging. At least one sign indicating the time and date that staging began is posted adjacent to staged waste.

Regular sweeping, cleaning, and best waste management methods practices are implemented in HWM Division Yards to prevent the dispersal of waste constituents. Historical sampling and analytical results from LLNL's facility-wide storm water monitoring program indicate that HWM Division operations have not contributed constituents of concern to surface water flow at LLNL. Therefore, based on the historical data and the standard HWM Division best management practices described above, allowing sheet-flow run-off from the HWM Division Yards is considered reasonable.

7 Ground Water and Environmental Monitoring

The establishment of a ground water and/or environmental monitoring program is required at regulated units (e.g., waste piles, surface impoundments, land treatment units, or landfills) or miscellaneous units when necessary to comply with the requirements of 22 CCR 66264, Article 16. The LLNL main site does not contain any regulated land-disposal units. The secondary containment systems, off-gas and ventilation control devices, and other building features are adequate to prevent releases to the environment. Waste water and air discharges are monitored to the extent required to comply with the permits issued for these effluents. General building monitoring and inspections will be conducted to ensure that the contaminant migration is prevented. As such, ground water and additional environmental monitoring is not required for the HWM units that will be located at the LLNL main site.

References

California Code of Regulations (CCR) (1995), Title 22, *Social Security*, Health and Welfare Agency, State of California, Sacramento, CA.

22 CCR 66260 (1996), Chapter 10, *Hazardous Waste Management System: General*, Part 66260, Health and Welfare Agency, State of California, Sacramento, CA.

22 CCR 66261 (1995), Chapter 11, *Identification and Listing of Hazardous Waste*, Part 66261, Health and Welfare Agency, State of California, Sacramento, CA.

22 CCR 66262 (1995), Chapter 12, *Standards Applicable to Generators of Hazardous Waste,* Part 66262, Health and Welfare Agency, State of California, Sacramento, CA.

22 CCR 66264 (1995), Chapter 14, *Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities*, Part 66264, Health and Welfare Agency, State of California, Sacramento, CA.

Code of Federal Regulations (CFR) (1995), Title 40, *Protection of the Environment,* Office of the Federal Register, Washington, D.C.

Code of Federal Regulations (CFR) (1997), Title 49, *Transportation,* Office of the Federal Register, Washington, D.C.

40 CFR 52 (1996), *Approval and Promulgation of Implementation Plans,* Office of the Federal Register, Washington, D.C.

40 CFR 60 (1996), Office of the Federal Register, Washington, D.C.

40 CFR 264 (1995), *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, Office of the Federal Register, Washington, D.C.

40 CFR 265 (1996), *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, Office of the Federal Register, Washington, D.C.

49 CFR 178 (1997), *Specifications for Packagings*, Office of the Federal Register, Washington, D.C.

Table IV-1 Types of Waste Managed Per Container Storage Unit

Container Storage Unit	Will liquid waste be managed?[a]	Will incompatible waste be managed?[b]	Will ignitable or reactive waste be managed?[c]
Building 280 Container Storage Unit	No [d]	Yes[e]	Yes
Area 612 Tank Trailer Storage Unit	Yes	Yes[f]	Yes[g, i]
Area 612 Portable Tank Storage Unit	Yes	Yes[f]	Yes[g]
Building 612 Container Storage Unit	Yes	Yes[e]	Yes
Building 612 Lab Packing/Packaging Container Storage Unit	Yes	Yes[e]	Yes
Area 612-1 Container Storage Unit	No	Yes[e]	Yes
Area 612-2 Container Storage Unit	Yes	Yes[e]	Yes
Area 612-4 Receiving, Segregation, and Container Storage Unit	Yes	Yes[e, h]	Yes
Area 612-5 Container Storage Unit	No	Yes[e]	Yes
Building 614 East Cells Container Storage Unit	Yes	Yes[e, h]	Yes
Building 614 West Cells Container Storage Unit	Yes	Yes[e]	Yes
Building 625 Container Storage Unit	Yes	Yes[e, h]	Yes[g]
Building 693 Container Storage Unit Cell 1000	Yes	Yes[e]	Yes
Building 693 Container Storage Unit Cells 1004, 1008, and 1012	Yes	Yes[e]	No
Building 693 Classified Waste Storage Annex	No [d]	No	Yes
Building 693 Freezer Storage	Yes	Yes[e]	Yes
Building 693 Roll-Off Bins	No	No	No

Continued on next page

Table IV-1 Continued

Container Storage Unit	Will liquid waste be managed?[a]	Will incompatible waste be managed?[b]	Will ignitable or reactive waste be managed?[c]
Building 695 Liquid Waste Processing Area	Yes	Yes[e]	Yes
Building 695 Airlock	Yes	Yes[f]	Yes
Building 695 Reactive Materials Cell	Yes	Yes[e]	Yes
Building 695 Reactive Waste Processing Room	Yes	Yes[e]	Yes
Building 695 Reactive Waste Storage Rooms	Yes	Yes[e, h]	Yes
Building 695 Small-Scale Treatment Laboratory	Yes	Yes[e]	Yes[g]
DWTF Portable Tank Storage Pad	Yes	Yes[f]	Yes[g]

a General compliance information for required secondary containment systems is presented in **Part IV.4** and detailed engineering reports are included as an appendix to the S/TUG-specific unit volumes (**Part XIV**). Engineering reports were prepared for each containment zone where liquid hazardous waste will be managed and include a description of the containment system (including calculations for the containment capacities) to demonstrate compliance with regulatory requirements.

b General compliance information is provided in **Part VI.2.4.6**. Specific design provisions (e.g., dikes, berms) are described in the S/TUG-specific unit volumes (**Part XIV**).

c General compliance information is provided in **Part VI.2.4.7**. Figures in Appendix II-A are provided to demonstrate that a 50-ft buffer zone is maintained between the property boundary and containers/tanks holding ignitable or reactive.

d Secondary containment is being provided for retention of fire water; containment for liquid waste is not being certified.

e Incompatible wastes are segregated on separate containment pallets or overpacks and are isolated from each other by distance. Minimum distance at separation is 2.5 ft. Containers are not stacked when containment pallets are used for segregation of incompatibles.

f At any time, the contents of all the waste containers stored within this unit are compatible with each other.

g Ignitable waste storage only; no reactive waste is stored in this unit.

h Separate containment zones (e.g., dikes and walls) are provided for segregated storage.

Table IV-2 Portable Tank and Tanker Specifications

Container Type	Capacity (gal)	Specification
Portable tank	330	DOT-E-9052, 40-in. by 48-in. by 63-in., stackable, cage with forklift pockets, linear polyethylene, 3/16-in. thick nominal
Portable tank	330–10,000	Polyethylene; UN 31H, nonDOT spec
Portable tank	400	Rectangular upright (stackable), thickness 7 gage nominal, 304 or 316 stainless steel, with stantions (stackable) and forklift access (non DOT spec)
Portable tank	60–660	Steel portable tank, DOT 57 (49 CFR 178.253) or equivalent
Portable tank	625	Stainless steel; UN 31A, nonDOT spec
Portable tank	750–1100	Thickness 7 gage nominal, 304 or 316 stainless steel horizontal tank with saddle, equipped with forklift pockets (non DOT spec)
Portable tank	1100	Thickness 7 gage nominal, mild steel tank, painted exterior saddle, equipped with forklift pockets (non DOT spec)
Tank trailer	500–5000	Stainless steel tank trailer, DOT MC312 (no longer cited in regulations) or MC412 (49 CFR 178.348)

DOT = U.S. Department of Transportation

CFR = Code of Federal Regulations

Table IV-3. RCRA Subpart CC Rule Container Compliance

Control level	Design capacity	Means of compliance	Applicable sections in 40 CFR
None	≤ 0.1 m^3	None required	264.1080(b)(2)
1	> 0.1 m^3 to ≤ 0.46 m^3	DOT-compliant container[a]	264.1086(b)(1)(i) 264.1086(c)(1)(i)
1	> 0.46 m^3 and not in light material service[b]	DOT-compliant container[a]; or A container equipped with a cover and closure devices that form a continuous barrier over the container openings. The cover may be separate (e.g., a lid or a tarp), or an integral part of the structure (e.g., portable tank). It is composed of suitable materials to minimize exposure of the hazardous waste to the atmosphere and to maintain the equipment integrity, for as long as the container is in service.	264.1086(b)(1)(ii), 264.1086(c)(1)(i), 264.1086(c)(1)(ii) 264.1086(g)
2	> 0.46 m^3 and in light material service[b]	DOT-compliant container[a]; or A container that operates with no detectable organic emissions[c], or A container that has been demonstrated to be vapor-tight[d]	264.1086(b)(1)(iii) 264.1086(d)(1) 264.1086(f) 264.1086(g) 264.1086(h)
3	> 0.1 m^3 and used for stabilization	Solidification Unit and container are vented inside an enclosure[e] which is exhausted through a closed-vent system to a control device	264.1086(b)(2) 264.1086(e)(1)(ii)

[a] Refer to 40 CFR 264.1086(f) for DOT-compliant container criteria.

[b] As defined in 40 CFR 265.1081, "in light material service" means the container is used to manage a material for which both of the following conditions apply: the vapor pressure of one or more of the organic constituents in the material is greater than 0.3 kilopascals (kPa) at 20°C; and the total concentration of the pure organic constituents having a vapor pressure greater than 0.3 kPa at 20°C is equal to or greater than 20 percent by weight.

[c] As defined in 40 CFR 265.1081, "no detectable organic emissions" means no escape of organics to the atmosphere as determined using the procedure specified in 40 CFR 265.1084(d). 40 CFR 264.1086(d)(1)(ii), container level 2 standards, states that no detectable organic emissions is to be determined using the procedures specified in 40 CFR 264.1086(g).

[d] Demonstrated within the preceding 12 months to be vapor-tight by using 40 CFR Part 60, Appendix A, Method 27, in accordance with the procedure specified in 40 CFR 264.1086(h).

[e] Designed and operated in accordance with the criteria for a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR 52.741, Appendix B.

DOT = U.S. Department of Transportation

CFR = Code of Federal Regulations

Appendix IV-A is located in Volume 5